

Biodiversity in primary rainforest in Aseki and adjacent highlands in Papua New Guinea, with focus on the insect fauna, especially the Coleoptera (Buprestidae and Cerambycidae)

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'About 1.4 million species of animals and plants on earth are described by taxonomists, perhaps 10% of all life. This situation is a scandal that few non-biologists seem to recognize. If only 10% of the companies being traded on Wall Street were known, people would be outraged! Not so with biodiversity. Given our ignorance of biodiversity, the exploding human population and its expanding effects on the globe is producing extinctions of species we will never have named or even described, a loss that we should not bequeath to our children and grandchildren' (Krebs 2001).

The senior author of this paper has been interested in entomology since early 1940, in the beginning mainly in Swedish beetles, later also in beetles from other parts of the world as Papua New Guinea. In the early 1990s' Mr. Peter B. Clark, Insect Farming and Trading Agency, IFTA in Bulolo, Morobe province, Papua New Guinea (PNG), was an outstanding supplier of rare and newly discovered beetles, especially of Buprestidae, Cerambycidae and Curculionidae families. Some years later a most fruitful cooperation was established with the junior author of this paper, Michael Hudson at the Wei Institute in Wau, Bulolo province in the last 16 years. He has discovered a large number of new species and also re-discovered species earlier known only by single specimens collected in the beginning of the XX century. He has collected and travelled in most parts of PNG and always explored new and interesting habitats. He has visited many villages and schools and talked both with the children and the teachers, who, in most cases, were interested and volunteered to collect insects for MH. After delivery the children earned some money for their families, which together with newly earned knowledge about nature and knowing

that a sound and environmentally harvesting of the rainforest will give back money for living, hopefully will increase their families concern about the environment's health.

In all regions with rainforest in Papua New Guinea and Papua many new species of living organisms have been found and described but still most of them are likely to be unknown to science. The soil may be very poor of nutritive substances as the vast amount has been used to build up the living forest from the ground level and very little has been left in the soil. A mountain near Aseki has been cleared and is now more like a desert.

In all parts of PNG MH has found new and interesting species, in lowland forests as well as in highland forests. At the slopes to the mountains and at the top there are *Calamus* palms, *Ficus* species, oaks *Lithocarpus*, *Podocarpus* and *Dacrydium novoguineense* and *Phyllocladus* species and several *Rhododendron* species. In the lowland rainforest are timber trees as *Dipterocarpus*, *Calophyllum* and *Intsia*. In the swamp live species as *Nipa* palms and Sago palms (*Cycas* spp.).

We have chosen to show more in detail the fauna we have found in the Aseki rainforest as well as in adjacent highlands. The reason is that we have found an extremely rich fauna with many new species. Both Wau and Bulolo are relatively near Aseki with IFTA and the Wei Institute and may be more reachable for collectors. However, which will be shown by a few pictures, the road to Aseki may be very uncomfortable many times in the year with deep mud and water, or the road may have slid down. For that reason Aseki region probably has not been visited more often than other regions with better communications.

Since 1988, fifteen new species of Buprestidae have been described and several new species



are in preparation for description. Concerning Cerambycidae, eleven have been described as new since 1980, however several other species are ready for description.

The following abbreviations have been used in this paper:

AT – Allotype;
Distr. – administrative district;
HT – Holotype;
IFTA – Insect Farming and Trading Agency, Bulolo, Morobe Province;
IRSN – Institut royal des Sciences naturelles de Belgique, Brixelles, Belgique;
MH – Michael Hudson;
CMH – Michael Hudson collection;
NRM – Naturhistoriska Riksmuseet, Stockholm, Sweden;
Prov. – administrative province;
PT – Paratype;
UN – Ulf Nylander;
CUN – Ulf Nylander collection.

Notes concerning Coleoptera: Buprestidae

Castiarina meeki was described by Théry (1937) from two specimens collected by Mr. A.S.Meek, the type at Aseki, Morobe Province, the paratype at Owgarra, British New Guinea. Now during recent years found in Aseki by school children in the blossoms of *Euodia* spp. trees.

Castiarina shelleybakeri Nylander, 2006, one male, was collected together with *Castiarina meeki* in the blossoms of *Euodia* sp. but MH observed the strange right antenna (left one was missing) in HT, and sent the specimen to the senior author. This species has a most remarkable antennal structure, unique in Buprestidae, antennomere 3 to 10th bipectinate, 11th tripectinate. This species is much like *C. meeki* with the colour of elytra but different by the form of pronotum and antennae. The presence of bipectinate to tripectinate antennae may have been caused by the need of a large number of chemical receptors to detect female pheromones in an environment where the sight was insufficient to find a mate. This could have been the fact for several million years ago when the tropical rainforests consisted of primitive plants, a damp atmosphere, where it would have been dark under the canopy even in brightest days. Probably bipectinate-tripectinate antennae are to be considered as an ancient evolutionary development. Extant species with these complicated antennae may be

considered as relict species. The HT is the only specimen known of this most interesting species.

Castiarina asekiensis Nylander, 2007. Four specimens of this small and beautiful species were collected at the same date, 18.09.2007, in Aseki, Hokanaiwa village by a local collector. To our knowledge no more specimens of this species are hitherto known. To emphasize that so many new and interesting species have been known just from the rainforest in Aseki and adjacent highlands this species has been given the name *C. asekiensis*.

Castiarina sedlaceki Barker, 1988. This species was described by S.Barker from a male specimen found at Mt. Kaindi at 2300 m elevation in 1979. Next specimen, a female, was collected at Hokanaiwa village, Aseki, in 2005.

Most species of *Castiarina* are known from Australia (near 480 species) and only 10 from New Guinea (the last one recently described by Holynski 2008) as *Castiarina nylanderi* has been collected at Lake Paniai in Papua). Of remaining 9 species from Papua New Guinea almost half the number, 4 species, were collected in the Aseki region.

Of the most splendid Stigmoderini genus *Calodema* 12 species are known from New Guinea and a half of this number recorded from the Aseki region: *Calodema bifasciata* Neef de Sainval et Lander, 1993, *C. blairi* Neef de Sainval et Lander, 1994, *C. hanloni* Nylander, 2008, *C. hudsoni* Neef de Sainval, 1998, *C. mariettae* Nylander, 1993, and *C. ribbei* Neervoort van de Poll, 1885.

The genus *Metaxymorpha* with 12 species known from New Guinea inclusive the Aru archipelago, have the following 6 species recorded from Aseki, Chimbu and Western Highlands Province: *M. apicerubra* Théry, 1923, *M. hilleri* Nylander, 2004, *M. hudsoni* Nylander, 2001, *M. landeri* Nylander, 2001, *M. nigrosuturalis* Neef de Sainval et Lander, 1903, and *M. meeki* Théry, 1923.

Of the interesting genus *Metataenia*, the species *M. loriae* Kerremans, 1896 was found at Paumomu River (L.Loria) near Bulolo. The HT is preserved at Museo Civico di Storia Naturale "Giacomo Doria" in Genova. Next specimen, *M. matrismae* Holynski, was described as a junior synonym of abovementioned species and had been collected at Cyclops Mts., Sabron in 1936. Recently, one more specimen was found 1997 at Pawamanga village, Aseki (1997) and the fourth specimen known to us - 2005 in Kamanea village, Aseki.

Metataenia gilvigeniculata Hoscheck, 1931 was found in single specimen in 1915 by the Sepik-



Fluß Expedition at Schraderberg (2100 m) and is preserved in the Museum für Naturkunde der A. Humboldt Universität Berlin. One more specimen was found at Okapa in 2004 by MH.

Metataenia sp., an undescribed species, was collected in Aseki, Pawamanga Village in June 1992 (one specimen) and 30.05.2006 (also in single specimen).

Observed Buprestidae specimens:

Cyphogastra albertisi Gestro, 1877. Aseki, 1991, IFTA.

Cyphogastra aterrima Kerremans, 1911. Bulolo, 1991, IFTA.

Cyphogastra chalcea Obenberger, 1924. Bulolo, 1987, IFTA.

Cyphogastra infranitens Kerremans, 1909. Bulolo, 1990, IFTA.

Cyphogastra uxorismeeae Holynski, 1994. Wau 1992, Bulolo, 1992 leg. P.Clark.

Cyphogastra venerea Thomson, 1857. Wau, 1991, IFTA.

Cyphogastra sp. ~15 spp. not yet determined from Aseki-Bulolo region.

Metataenia auricollis Kerremans, 1898. Bulolo, 1991-1998, leg. IFTA & MH.

Metataenia gilvigeniculata Hoscheck, 1931. Okapa, Eastern Highlands Province, 03.2004, leg. MH.

Metataenia loriae Kerremans, 1896. Aseki, Kamanea village, 2005, leg. MH, Aseki Pawamanga village, 1997, leg. MH.

Metataenia sp., undescribed species. Aseki, 2006, leg. MH.

Iridotaenia callosicollis H.Deyrolle, 1864. Tei Adu village, Morobe Prov., 2000, leg. MH.

Castiarina asekiensis Nylander, 2001. Aseki, Hokanaiwa village, 1907, HT in CUN, leg. MH.

Castiarina hudsoni Nylander, 2001. Aseki, Olwa village, 1997, HT, leg. MH, Kuper Range, 2200 m, Morobe Prov., 1995, PT in CUN, leg. MH.

Castiarina meeki Théry, 1937. Aseki Hokanaiwa village, 1999, leg. MH, Wau, Kapiro village 1997, leg. MH.

Castiarina sedlaceki Baker, 1988. Aseki, Hokanaiwa village, 2005, leg. MH.

Castiarina shelleybakeri Nylander, 2006. Aseki, 2005, HT in CUN, leg. MH.

Calodema bifasciata Need de Sainval et Lander, 1993. Aseki, 2 PT, leg. P.Clark, Chimbu, Prov. Kerowagi.

Calodema blairi Neef de Sainval et Lander, 1994.

Passala, near Aseki 1991, 2 PT, leg. P.Clark, Aseki, Hokanaiwa village, 2003, leg. MH.

Calodema hanloni Nylander, 2008. Jimmi Valley, Western Highlands Province, 1991. Specimen from Mark Hanlon collection, Australia. HT lost in a transfer flight from Sweden to Australia.

Calodema hudsoni Neef de Sainval, 1998. Aseki, Hokanaiwa village, 2005, leg. MH, Tekadu village, 2000, leg. MH.

Calodema longitarsis Nylander, 2008. Kaula village, Kerowagi, Chimbu Province, 2005, HT in CUN, leg. MH.

Calodema mariettae Nylander 1993. Aseki, 1992, HT, leg. P.Clark, Aseki, Hokanaiwa village, 1997-1998, HT in CUN.

Calodema ribbei ribbei Neervoort van de Poll, 1885. Aseki region, Aninge village, Hikewini village, 1990-1993, leg. P.Clark, Hokanaiwa village, Pawamanga village, Yamaiya village, 1997-1998, leg. MH, Gumi village, Watut, 2002.

Calodema ribbei flavofasciata Nylander, 1998. Garaina, 1996, leg. MH.

Metaxymorpha apicerubra Théry, 1923. Aseki, 1995, Aseki, Hokanaiwa village, 1997-2004, leg. MH.

Metaxymorpha hilleri Nylander, 2004. Jimmi Valley, Western Highlands Province, HT in CUN, Aseki, 2000, PT in CMH.

Metaxymorpha hudsoni Nylander, 2001. Aseki, Hokanaiwa village, HT in CUN.

Metaxymorpha landeri Nylander, 2001. Kondiu, between Kundiawa and Mt. Hagen, 1964, HT in collection T.Lander (Geneva).

Metaxymorpha meeki Théry, 1923. Morobe Prov., Aseki, 1991-2005, Hamoini village, Hokanaiwa village, Damauwa village.

Metaxymorpha nigrosuturalis Neef de Sainval et Lander, 1993. Wau, Morobe Prov., 1991, PT, Aseki, 1992, Aseki, Watut, Pawamanga, 1992, Aseki, Hokanaiwa village, 1998, Aseki 1998, 2001.

Notes concerning Coleoptera: Cerambycidae

Analophus vicksoni Nylander et Komiya, 2005. A large Prionini species described from Aseki, first collected in 2000 by MH. Of same genus, *A. parallelus* Waterhouse, 1877 is known from Queensland, Australia. A second species of this genus, *A. niger*, was described by Gahan (1894) from single male collected at Mt. Arfak, Papua. Now the third species of this genus is known from Aseki.

Batocera wallacei Thomson, 1858 is rather



common in Aseki rainforest as well as subspecies *B. wallacei prosperina* Thomson.

Buprestomorpha and *Tmesisternus* species presented with several species in Aseki region, also probably undescribed species have been found.

Cacodacnus lameerei, described by Swedish entomologist Aurivillius in 1926 from single specimen, collected at Bolan Mts., was re-found in Bulolo, 03.1999 and in Wau Valley in 2005 by MH.

Elaptus (Miocyclus) prionides Pascoe, 1875. Aseki, 04.2000, leg. MH. According to Gressitt (1959) the only Anacoloni known from New Guinea is *Asea media* Lameere, 1912 recorded also from Cape York, Australia. Our specimen of *E. prionides* seems to be the single one known from Papua New Guinea. One specimen of this species was sent to Alain Drumont (IRSN) for determination. It was collected at Armidale in New South Wales, Australia.

Gnathonyx orientalis Komiya et Nylander, 2005. This large representative of Prionini was collected at Kaindi village, Wau.

The large and very nice *Omotagus lacordairei* Pascoe, 1867 previously only known from Sattelberg and New Brittain, has also been found in Aseki and Bulolo.

In the genus *Osphryon* Pascoe, 1869 ten species were previously known. *O. adustus* Pascoe, 1869 and *O. hirticollis* Pascoe, 1869 - both from Dorey, and *O. forbesi* Pascoe, 1869 from Sattelberg. Schwartzter described in 1924 *O. spinicarpus* from Doormanpabbivak at an altitude of 1400 m. Aurivillius described in 1926 *O. granuliger* from Bolan Mountains. Gressitt described in 1951 five additional species:, namely *O. pallidipennis* from Fly River, *O. woodlarkiensis* from the island Woodlark, *O. subitanus* from Papua New Guinea, *O. sudestus* from the island Sudest and *O. tridentatus* from New Britain. Specimens of *Osphryon adustus*, *O. forbesi*, *O. pallidipennis*, *O. subitanus* and *O. woodlarkiensis* are preserved in CUN.

Osphryon bispinosus Nylander, 1998 was described from a female collected at Okapa in 1990 by IFTA, HT in CUN.

Osphryon wauensis Nylander, 1998 was described from two females collected 1993 in Wau by IFTA, HT and PT in CUN.

Genus *Potemnemus* is presented with eight species in Aseki region, of whom three species are not yet described.

Of genus *Rosenbergia* 12 species are known from Aseki and adjacent highlands, of them *Rosenbergia hudsoni* Nylander, 2004 and *Rosenbergia drumonti* Wallin et Nylander, 2007 were described recently.

Other rare *Rosenbergia* species, *R. scutellaris* Aurivillius, 1924 (originally described from Aseki), was re-discovered here 1992 in Pawamanga village. HT in NRM and the specimen from Pawamanga in CUN.

Toxeutus dentifrons Aurivillius, 1925. The HT coming from Bolan Mts. and this species is now re-collected in a few specimens at Wau and Bulolo in 1991.

Observed Cerambycidae specimens:

Acalolepta anterior antenor Newman, 1842 (det. Hüdopohl 1996). Wau, 1990.

Acalolepta bolanica Aurivillius, 1926 (det. Hüdopohl, 1997). Wau, 1990, IFTA, Bulolo, Manki Range, 1997, Aseki, 1991.

Acalolepta pseudotinctura Breuning, 1935. Bulolo, 1990, IFTA.

Acalolepta sp.1. near *A. bolanica* Aurivillius, 1926. Jimmi Valley, 1997, leg. MH.

Acalolepta sp.2. Kerowagi, 1996.

Acalolepta sp.3. Wau, Kapiro village, 1998.

Acalolepta sp.4. Wau Valley, 1200 m.

Acalolepta sp.5. Wau Valley, 1200 m.

Acalolepta sp.6. Aseki, Hiewini village, 1998.

Acalolepta sp.7. Bulolo, 1991, leg. MH.

Aeolesthes induta Gahan, 1842 (det. Hüdopohl, 1997). Wau Valley, 1200 m.

Agrianome loriai Gestro, 1893. Wau and Bulolo, 1991, 1996.

Analophus vicksoni Nylander et Komiya, 2005. Aseki, 2000, HT & PT, leg. MH.

Archetypus fuvipennis Pascoe, 1859. Wau, 1990, IFTA.

Batocera laena Thomson, 1858. Aseki, Bulolo, Wau, 1991.

Batocera matzdorffi Kriesche, 1915. Maprik, 1998.

Batocera wallacei wallacei Thomson, 1858. Aseki, 1991, Maprik.

Batocera wallacei prosperina Thomson, 1858. Bulolo, 1991.

Buprestomorpha sp. possible undescribed species. Aseki, 1990.

Cacodacnus lameerei Aurivillius, 1925. Wau Valley, 2005, leg. MH.

Chloridium sp. possible undescribed species. Aseki, 1990.

Coptopterus latus Gressitt, 1959. Wau Valley, 1999.

Coptocerus mutabilis Gressitt, 1959. Wau, Kapiro village, 2000.

Coptopterus sp. possible undescribed species. Jimmi Vally, W Highlands, 2002.



- Dictamnina* sp. possible undescribed species. Aseki, Hiewini village, 1997.
- Dihammus australis* Boisduval, 1835. Bulolo, 1979.
- Elaptus (Miocys) prionides* Pascoe, 1875. Aseki, 2000.
- Glenea spinifera* Voet, 1804 (det. Hüddepohl, 1997). Aseki.
- Glenea lefebvrei* Guérin-Méneville, 1831 (det. Hüddepohl, 1996). Aseki, 1991.
- Gnathonyx orientalis* Komiya et Nylander, 2005. Kaindi, Wau, 1996, 4 PT, IFTA.
- Gnoma boisduvali* Plavilstshikov, 1931. Bulolo, 1990, IFTA.
- Metaperiaptodes granulatus* Aurivillius, 1908 (det. Hüddepohl, 1996). Aseki, 1991.
- Nyphasia pulchra* Gressitt, 1951. Bulolo, Jerry village, 1999, leg. MH, Wau Valley, 1999, leg. MH.
- Omotagus lacordairei* Pascoe, 1867. Aseki, Andhua village, 2000, leg. MH, Bulolo, 1991.
- Osphryon adustus* Pascoe, 1869. Bulolo, 1989?, leg. R.Holynski.
- Osphryon bispinosus* Nylander, 1998. Okapa, Eastern Highlands Prov., 1990, HT in CUN.
- Osphryon wauensis* Nylander, 1998. Wau, 1991, HT, Bulolo 1993, PT in CUN.
- Papuandra araucariae* Gressitt, 1959. Bulolo, 1964, Wau Valley, 1999, 1200 m.
- Parepepeotes togatus* Perris, 1855. Wau, 1991, Bulolo 1991, IFTA.
- Pelargoderus assimilis* Aurivillius, 1908. Wau Valley, 1991, 1999.
- Pelargoderus* sp. undescribed species, close to *P. malacensis* Breuning, 1935. Bulolo, 1991.
- Periaptodes lector* Pascoe, 1866. Bulolo, 1994.
- Periaptodes* sp. Jimmi Valley.
- Piesarthini*, gen. sp., possible undescribed genus close to *Coptopteris*. Aseki, Yamaya village, 1998.
- Potemnemus detzneri* Kriesche, 1823. Aseki, 1990-1992.
- Potemnemus hispidus* Gressitt, 1952. Aseki, 1991.
- Potemnemus trituberculatus* Breuning, 1944. Aseki, 1991, Anodya, 1991.
- Potemnemus rosenbergi* Vollenhoven, 1871. Aseki, 1991, 2000.
- Potemnemus sepicanus* Kriesche, 1923. Aseki, 1992-1993.
- Potemnemus* sp.1 undescribed species. Aseki, Korenga village.
- Potemnemus* sp.2 undescribed species. Aseki, Kapau village, 1997.
- Potemnemus* sp.3 undescribed species. Aseki, Yeva village, 1997, Aseki, Hiewini village, 1998.
- Rosenbergia breuningi* Rigout, 1982. Okapa, 1981, leg. P.Clark.
- Rosenbergia clarki* Rigout, 1982. Okapa, Eastern Highlands Prov., 2000, leg. MH.
- Rosenbergia diannae valentinae* Rigout, 2004. Aseki, Yamaia village, 2002, Aseki, Hokanaiva village, 2002, Aseki, Wingia village, 2005.
- Rosenbergia drumonti* Wallin et Nylander, 2007. Kerowagi, Chimbu Prov., 1990, HT, Kainanto, Eastern Highlands Prov., 1990, PT, Kerowagi, Chimbu Prov., 1990, PT, Okapa, Eastern Highlands Prov., 1982, HT+ AT + PT in CUN.
- Rosenbergia gilmouri* Rigout, 1982. Bulolo, Mankin Range, 1999, Bulolo, New Camp, Bulolo village, 1999, Manko Range, 1999, leg. MH.
- Rosenbergia hudsoni* Nylander, 2004. Aseki, Hokanaiva village, 2000, HT, leg. MH, Wau Distr., Jerry village, 1996, AT, leg. MH, Garaina, Biarua village, 1999, PT, leg. MH. HT + AT + PT in CUN, PT in CMH.
- Rosenbergia mandibularis* Ritsema, 1881. Bulolo, 1990, IFTA, Wau, 2005.
- Rosenbergia rufolineata* Breuning, 1948. Okapa, 2004, Kerowagi, 2000.
- Rosenbergia scutellaris* Aurivillius, 1924. Aseki, Pawamanga, 1992.
- Rosenbergia vetusta* Ritsema, 1881. Wau, 1988, 1200 m.
- Rosenbergia weiskei* Heller, 1902. Wau, Kapiro village, Aseki, Okapa.
- Rosenbergia xenium* Gilmour, 1959. Aseki, Paivini village, 1997, Papatia village, 2001, Waria Valley, 2006, leg. MH.
- Sphingnotus insignis albertisi* Gestro, 1876. Bulolo, 1990, IFTA.
- Sphingnotus mirabilis* Boisduval, 1835. Aseki, Bulolo, 1990, IFTA.
- Tmesisternus excellens excellens* Aurivillius, 1908. Aseki, Oswa village, 1999, leg. MH.
- Tmesisternus dohertyi* Jordan, 1894. Ohu village.
- Tmesisternus sulcatus* Aurivillius, 1911. Aseki, 1991, Aseki, Auyanto village, 1998, Coll. No. UN309.
- Tmesisternus renii* Gressitt, 1984. Aseki, 1998.
- Tmesisternus vinculatus* Heller, 1914. Aseki, Hiewini village, 1998.
- Tmesisternus* sp.1 possible undescribed species. Wau, Okapa, 1990-1991.
- Tmesisternus* sp.2 possible undescribed species. Okapa, Coll. No. UN310.
- Tmesisternus* sp.3 possible undescribed species. Tekadu village, Coll. No. UN93.
- Toxetus dentifrons* Aurivillius, 1925. Aseki, Kapiro



village, Wau, 1992-1997, IFTA.

- Tryphocaria montana* Gressitt, 1959 (det. Hüdelpohl, 1999). Aseki, Hiewini village, 1997.
Xixuthrus (Xixuthrus) costatus Montrouzier, 1855. Bulolo, 1991, IFTA.
Xixuthrus (Daemomarthra) helleri Lameere, 1903. Aseki, 1996, IFTA.
Xixuthrus (Xixuthrus) microcerus axis Thomson, 1877. Papua New Guinea, 1996, IFTA.
Xystrocera apiculata Gahan, 1869. Wau Valley, 1200 m, 1997-1999, leg. MH.

Observed Curculionidae specimens:

- Eupholus albofasciatus* Heller, 1910. Kapiso, Garping, 1992, leg. P.Clark.
Eupholus bennetti Gestro, 1876. Aseki, Ananadla village, 1991, leg. P.Clark.
Eupholus loriae Gestro, 1902. Tekadu, 1991, 1992, leg. P.Clark.
Eupholus messagieri Porion, 1993. Okapa, 1992, leg. P.Clark.
Eupholus nickerli Heller, 1913. Upper Vatut Valley, leg. P.Clark.
Eupholus quinitaenia Heller, 1915. Maprik, 1991, leg. P.Clark.
Eupholus sp. Bulolo, 1992, leg. P.Clark.
Gymnopholus spp.
Pantorhytes spp.
 Most specimens of the last two genera have been sent to the Bishop Museum, Honolulu, U.S.A. for proper examination.

Observed Lucanidae specimens:

- Aegus platydon bellus* Möllenkamp, 1902. Aseki, Koteao village, 29.06.1999, leg. MH, Wau Valley, 1200 m, 05.07.1999, leg. MH, Wau Valley, 1200 m, 15.07.1999, leg. MH.
Cyclommatus eximus Möllenkamp, 1909. Wau, Kapiro village, 23.04.1995, leg. P.Clark, Kapiro village, Wau, 25.01.1999, leg. MH.
Cyclommatus imperator imperator Boileau, 1905. Okapa, Awande village, 27.04.1995, leg. P.Clark, Jimmi Valley, 21.06.1999, leg. MH, Kerowagi, Chimu Prov., 23.07.1999, leg. MH.
Cyclommatus pulchellus Möllenkamp, 1900. Wau Valley, 1200 m, 15.06.1999, leg. MH, Watut, Bulolo, Morobe Prov., 09.06.1999, leg. MH, Wau Distr., Kapiro village, 18.06.1999, leg. MH, Wau Distr., Kapiro village, 15.07.1999, leg. MH.

- Cyclommatus weinreichi* Lacroix, 1972. Aseki, Hiyewini village, 08.07.1999, leg. MH, 23.04.1998, leg. MH.
Dorcus arfakianus Lansberge, 1880. Wau, Kapiro village, 18.04.1995, leg. P.Clark, 06.05.1999, leg. MH, 28.07.1999, leg. MH, Wau Valley, 1200 m, 15.04.1999, leg. MH, Biarur village, Morobe Prov., 12.07.1999, leg. MH.
Dorcus egregius Möllenkamp, 1897. Maprik, East Sepik Prov., 13.04.1999, leg. MH, 13.04.1999, leg. MH.
Dorcus meeki Boileau, 1906. Wau village, Morobe Prov., 06.06.1995, leg. P.Clark, Biarur village, Morobe Prov., 12.07.1999, leg. MH, , 28.06.1999, leg. MH, Hiyowini village, Aseki, 14.07.1999, leg. MH, Aseki, Hiyewini village, 08.07.1999, leg. MH.
Lamprima adolphinae Gestro, 1875. Wau Distr., Kapiro village, 11.02.1998, leg. MH, 17.02.1999, leg. MH, 20.06.1999, leg. MH, Aseki, Handudulfi village, 13.07.1998, leg. MH, Aseki, Jakoini village, 11.03.1998, leg. MH, Jimmi Valley, 21.07.1997, Watut, Bulolo, 16.06.1999, leg. MH.
Prosopocoilus bison cinctus Montrouzier, 1857. Aseki, Hiyewini village, 14.07.1999, leg. MH, Garaina village, Morobe Prov., 22.07.1999, Wau, Kapiro village, 28.07.1999, leg. MH, 19.05.1995, leg. MH, 18.06.1999, leg. MH, Wau, Valley, 1200 m, 23.04.1999, leg. MH.

Observed Dynastinae (Scarabaeidae) specimens:

- Calocrates fleschei* Heller, 1903. Okapa, Eastern Highlands Prov., 04.2002, leg. MH.
Eupatorus beccarii Gestro, 1876. Jerry village, Bulolo, 28.12.1998, Jerry Village, Bulolo, 06.05.1998, leg. MH.
Oryctes centaurus Stenberg, 1910. Tekadu village, Morobe Prov., 13.04.2000, leg. MH.
Scapanes australis brevicornis Sternberg, 1908. Takadu village, Morobe Prov., 13.04.2000, leg. MH.

Observed Cetoniinae Schizorhinini (Scarabaeidae) specimens:

- Ischiopsopha cuprea* Moser, 1906. Wau District, Kapiro village, Morobe Prov., 07.01.2000, 09.01.2000, leg. MH.
Ischiopsopha jamesi Waterhouse, 1876. Tekadu village, Morobe Prov., 09.03.2000,



21.03.2000, leg. MH.

Ischiopsopha jamesi " var. *coerula*" Heller, 1899.
Alotau, Milne Bay Province, 30.04.1999, leg.
MH.

Ischiopsopha cf. *hyla* Heller, 1894. Wau Valley,
1200 m, Morobe Prov., 29.11.1999, leg.
MH, Kapiro village, Wau Distr., Morobe Prov.,
11.01.2000, leg. MH.

Conclusions and comments

The rainforest in Aseki region and adjacent highlands is of utmost interest concerning the biodiversity of studied insects, especially when focusing on Buprestidae and Cerambycidae (Coleoptera). As seen from the collection list presented above, a lot of most rare and insufficiently known species hitherto known by a few specimens were only registered from this area. Of totally ten species of the Buprestidae genus *Castiarina* five are known from this region. Two of these, *C. shelleybakeri* Nylander, and *C. asekiensis* Nylander, are only known from Aseki. This is also the case for several *Calodema* and *Metaxymorpha* species and for the large numbers of Curculionidae. Perhaps the bad conditions of the roads in the region may have been a factor to prevent the logging factories to invade this region. It would be a great loss to mankind if such a region with that kind of unique biodiversity should be destroyed by logging or by oil palm plantations.

One of authors, MH, went 2009 to a village near the east coast of Papua New Guinea, on the eastern side of Owen Stanley Range, the only known locality of the Queen Alexandra's Bird-wing, *Ornithoptera alexandrae* Rothschild, 1907 (which belongs to Protected Fauna, CITES (EG) No. 338/97 - D, Abrera 1975). The road, 32 km long, with solid oil plantations on each side ended in a logging operation. The oil company was ready to plant a second crop of oil palm in the area and had injected the huge palms with herbicide to fight them in order to plant new ones again. The locals told MH that once the second crop is finished all the nutrients in the soil will be finished and their land will turn into a desert! It is tragic that they know what will happen to their land for the next generation and they still make bad decisions because they feel like they have no other choices. Queen Alexandra's Bird-wing is protected by local and international law acts, but not its foodplant *Aristolochia schlecteri*! If the same catastrophic events should happen with the Aseki rainforest and adjacent highlands,

a large number of endemic and most interesting insect species of the same dignity as the doomed *O. alexandrae*, would be outranged. We do hope that this never will happen.

As seen of the species lists a large number of species belonging to families of special interest to the authors of this paper, have been collected in the Aseki region and adjacent highlands of Papua New Guinea. However most species have been found in small numbers, often in one or few specimens only. In most cases, as those collected in flowers in the canopy of the rainforests trees, no information concerning the biology is known. Even in large and well known species as *Calodema ribbei*, the food plant and the larval stadium are not fully understood. No *Calodema* larvae have been observed or described. Few years ago MH and his assistant Mr. Kotaseao found five larvae, possible of *C. ribbei* (buprestid larvae of right dimensions and exactly in the forest where *C. ribbei* had been previously collected) in the stem and branches of a tree, local people called *Tafaia*. MH tried to rear the larvae but without success. The senior author got the larvae and published photographs of them, presented in the book concerning diversity of New Guinean *Calodema* and *Metaxymorpha* (Nylander 2008b). Samples of this tree were presented the University in Lae. Unfortunately it could not be determined and was even regarded as not yet described.

This situation is not unique and seems to be a real problem. According to professor Torbjörn Ebenhard (Uppsala University) ten hectare rainforest in Borneo may contain more than 700 trees species. Probably the rainforest in New Guinea may, in that respect, not differ too much. The flora on the ground is rather meagre due to exhausted soil and lack of sunlight. Up in the trees the situation is quite different with a rich flora of orchids, fern plants, lichens, bromeliad-like species. On these plants, a lot of animals are connecting as frogs and insects. One rainforest tree in Peru contained 43 different species of ants (other insects were not counted). During the evolution the trees have used different options to try to defend them self from being "eaten up". One is to harbour ants, which is effective as the ants will go to attack as soon as the tree is threatened. The mostly used method is that the plant or tree will produce a kind of poison. This method is also effective but some animals may get tolerance against that poison. The result is that an insect species will be depending only of a few plants or tree species. This is one reason why the rainforest is sensible against any disturbances.



However the rainforest is not a stationary system. Forest fires and tornados may open up some parts of the rainforest and get place for new species to establish. During the time the result will be that different parts of a rainforest may vary much depending on both flora and fauna. The result may be the possibility for new species to develop giving an even more rich flora and fauna.

To cut down the rainforest and export the wood will result in a disaster. As the organic material is bound in the flora and fauna the soil will be very poor in nutrients. All nutrients after the death of animals and flora will go back to living organisms. If the rainforest is cleaned and the trees exported also all nutrients have been exported. Of that reason even relatively small cleaned areas will lose their ability for regeneration. A rainforest has its own circulated water-system, evaporation from the flora during the day and going back as rain at the end of the day. If the rainforest is cleaned this water circulation will stop and the area will turn to a desert.

Concerning the rainforest in Aseki and adjacent highlands a large amount of new insect species have been discovered. As seen of the foregoing discussion the content of the rainforest concerning the numbers of species may vary. The studied areas have a very rich fauna of new species and of species reported earlier in few specimens and now rediscovered. Most of the new findings are made by unskilled collectors. That means that no information is known concerning the biology of these species.

As seen of the foregoing even lack of information is obvious concerning which trees and plants are building up these rainforests. That a lot of insect species, known earlier in very few specimens now have been rediscovered in these forests will point out the outstanding scientific quality they have.

An other aspect is the lack of information concerning the chemical and medical use of products from this rainforests. Much scientific works still have to be done.

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References (with the data on Aseki region)

Ecology

- Gressitt J.L. 1982. *Biogeography and Ecology of New Guinea*. 1. *Biological exploration of New Guinea*. Frodin D.G., Gressitt J.L. (eds.) Monographiae, Volume 42. Dr. W.Junk Publishers, The Hague-Boston-London: 87-130.
- Gressitt J.L. 1982. *Biogeography and Ecology of New Guinea*. 2. Vol. 42. Illies J., Gressitt J.L. (eds.) Dr. W.Junk Publishers. The Hague-Boston-London: 709-734.
- Knight W.J., Holloway J.D. 1990. *Insects and the Rain Forests of South East Asia (Wallacea)*. The Royal Entomological Society of London The Chameleon Press Ltd, Wandsworth, London: 343 pp.
- Krebs C.J. 2001. *Ecology. The Experimental Analysis of Distribution and Abundance*. 5th edition. San Francisco, Benjamin Cummings: 699 pp.
- Novotny V., Drozd P., Miller S.E., Kulfan M., Janda M., Basset Y., Weiblen D. 2006. *Why are so many species of Herbivorous Insects in Tropical Rainforests?* — *Scienceexpress* 13 July: 1-8.
- Weiblen G.D., Webb C.O. Novotny V., Basset Y., Miller S.C. 2006. Phylogenetic Dispersion of Host use in a Tropical Insect Herbivore Community. — *Ecology*, **87**, No. 7 Supplementum: 62-75.
- Samuelson G.A. 1970. A coding system for marking *Gymnopholus* weevils in New Guinea. — *Pacific Insects* **12**, No. 4: 769-772.

Lepidoptera

- D'Abrera B. 1975. *Birdwing Butterflies of the World*. Lansdowne Press, Melbourne: 260 pp.

Coleoptera: Buprestidae

- Bellamy C.L., Sacramento C.A., Nylander U. 2007. New Genus-Group Synonymy in Stigmoderini (Coleoptera: Buprestidae). — *The Coleopterists Bulletin* **61**, No. 3: 423-427.
- Bellamy C.L. 2008. *A World Catalogue and Bibliography of the Jewel Beetles (Coleoptera, Buprestoidea)*. Pensoft Publishers, Sofia-Moscow: 3125 pp.
- Holynski R.B. 1994. Three new species of Buprestidae (Coleoptera: Buprestidae) from the Indo-Pacific Region. — *Jewel Beetles* **3**: 1-9.
- Holynski R.B. 1997. Mroczkowskia-Knot and the evolution of the subtribe Chrysochroina (Coleoptera: Buprestidae). — *Annales Zoologici* **47**, No. 1-2: 179-188.
- Holynski R.B. 2008. A new species of New Guinean *Stigmodera* Esch. and remarks on *Pseudhyperantha* Snd. (Coleoptera: Buprestidae). — *Opole Scientific Society Nature Journal* **41**: 43-48.



- Holynski R.B. 2009. Taxonomic structure of the subtribe Chrysochroina Cast. with review of the genus *Chrysochroa* Dej. Gondwana, Warszawa: 391 pp. + 9 pp. index.
- Hoscheck A.B. 1931. Beiträge zur Kenntnis der Buprestiden (Col.) IV. — *Mitteilungen aus dem Zoologischen Museum Berlin* **17**: 726.
- Hawkeswood J.T. 2007. *Petersonia* gen. nov. (Coleoptera: Buprestidae) from Papua New Guinea and a redescription of *Petersonia shelleybarkeri* (Nylander, 2006). — *Calodema Supplementary Paper* **9**, www.calodema.com
- Kerremans Ch. 1900. Buprestides Indo-Malais (63). — *Mémoires de la Société Entomologique* **7**: 1-60.
- Kerremans Ch. 1909-1910 *Monographie des Buprestides*. Tome **IV** Chalcophorini: Chalcophorites (7-9). J.Janssens, Bruxelles: 285 pp.
- Nylander U. 1993. A new *Calodema* (Coleoptera Buprestidae). — *Bulletin de la Société Sciences Naturelles* **79**: 8.
- Nylander U. 1998. A new subspecies of *Calodema* (Laporte & Gory, 1838) from the Madang Province, Papua New Guinea (Coleoptera, Buprestidae). — *Jewel Beetles* **7**: 16-17.
- Nylander U. 2000. A new species of *Calodema* (Laporte & Gory, 1838) from the Madang Province, Papua New Guinea (Coleoptera, Buprestidae, Stigmoderini). — *Lambillionea* **100**, No. 2: 203-206.
- Nylander U. 2001a. The New Guinean species of the genus *Castiarina* Gory & Laporte, 1837 and description of a new species (Coleoptera, Buprestidae, Stigmoderini). — *Lambillionea* **101**, No. 1: 51-54.
- Nylander U. 2001b. The New Guinea species of the genus *Metaxymorpha* and description of four new species and the allotype of *Metaxymorpha apicalis* (Coleoptera, Buprestidae). — *Lambillionea* **101**, No. 2, Supplément 2: 324-341.
- Nylander U. 2004. Description of a new species of *Calodema* (Laporte & Gory, 1837) and of two new species of *Metaxymorpha* (Parry, 1848) from the rainforests in New Guinea. — *Lambillionea* **103**, No. 1: 391-400.
- Nylander U. 2006a. Description of a new species of *Calodema* (Gory & Laporte, 1838) from Milne Bay Province, Papua New Guinea (Coleoptera, Buprestidae). — *Lambillionea* **106**, No. 2: 303-305.
- Nylander U. 2006b. The New Guinean species of the genus *Castiarina* Gory & Laporte, 1838 (Coleoptera, Buprestidae, Stigmoderini). — *Lambillionea* **103**, No. 2: 3-13 (republished photos **107**, No. 2:337).
- Nylander U. 2007a. The New Guinean species of the genus *Castiarina*. — *Lambillionea* **107**, No. 2: 337.
- Nylander U. 2007b. The New Guinean species of the genus *Castiarina* Gory & Laporte de Castelnau. Description of a new species (Coleoptera, Buprestidae, Stigmoderini). — *Lambillionea* **107**, No. 4: 631-634.
- Nylander U. 2008a. New synonymy in the genus *Metataenia* Théry (Coleoptera, Buprestidae). — *Lambillionea* **108**, No. 2: 206-207.
- Nylander U. 2008b. A review of the genera *Calodema* and *Metaxymorpha* (Coleoptera: Buprestidae: Stigmoderini). — *Folia Heyrovskyana*, Supplementum **13**: 84 pp.
- Nylander U. 2010. Notes concerning the genus *Metataenia* Théry, 1923 (Coleoptera, Buprestidae, Chrysochroina) from Papua New Guinea, with description of a new species and designation of a lectotype. — *Zootaxa* **2529**: 55-64.
- Coleoptera: Cerambycidae**
- Breuning D.E.E. 1943. Études sur les Lamières (Col. *Ceramby.*) Douzième tribus: Agniini Thomson. — *Novitates Entomologicae*. Troisième Supplément (paginé à part), feuilles 89 à 106: 137-183. Cabinet Entomologique E. le Moult 4, rue Duméril, Paris.
- Breuning D.E.E. 1944. Études sur les Lamières (Col. *Ceramby.*) — *Novitates Entomologicae*. Troisième Supplément (paginé à part), feuilles 107 à 135: 281-512. Cabinet Entomologique E. le Moult 4, rue Duméril, Paris.
- Breuning S. von 1963. Revision der Pteropliini der australischen Region (Coleoptera, Cerambycidae). — *Entomologische Abhandlungen aus dem Staatlichen Museum für Tierkunde in Dresden* **29** No. 1: 1-274.
- Breuning S. von 1969. *Catalogue des Lamières du Monde*. (Col. *Ceramby.*) Verlag des Museums G. Frey, Tutzing bei München. 11. Lieferung, 1: 1069 pp.
- Delahaye N. 2000. *Catalogue of Cerambycidae of the World. First Part: Cerambycinae*. Norbert Delahaye, Chaville, France: 175 pp. + bibliography 18 pp.
- Delahaye N. 2001. *Catalogue of Cerambycidae of the World. Third Part: Prioninae*. Norbert Delahaye, Chaville France: 32 pp. + bibliography 19 pp.
- Fuchs E. von 1962. Neue Cerambyciden aus der ehemaligen Sammlung Dr. Izingen, 2. Teil (Col.) Cerambycinae, *Tryphocaria freyi* n. sp. — *Entomologische Arbeiten aus dem Museum Frey* **13**: 321-322.
- Gilmour F.E. 1966. Revision of the Genus *Rosenbergia* Ritsema (Coleoptera, Cerambycidae, Lamiinae). Part 3, with two plates. — *Reichenbachia* **6**, No. 30: 245-260.
- Gressitt J.L. 1959. Longicorn Beetles from New Guinea, I



- (Cerambycidae). — *Pacific Insects* **1**, No. 1: 59-171.
- Gressitt J.L. 1984. Systematics and Biogeography of the Longicorn Beetle Tribe Tmesisternini. — *Pacific Insects* **41**: 1-263.
- Hawkeswood T.J., Dauber D. 1992. Review of the biology of *Gnoma boisduvali* Plavilstshikov, a longhorn beetle from the rainforests of Papua New Guinea and Irian Jaya (Insecta, Coleoptera, Cerambycidae, Lamiinae). — *Spixiana* **15**: 253-260.
- Komiya Z., Nylander U. 2005. A taxonomic revision of the genus *Gnatonyx* Gahan (Coleoptera, Cerambycidae, Prioninae). — *Lambillionea* **105**, Supplément 4: 1-16.
- Lameere A. 1913. *Coleopterorum Catalogus*. In: Junk W., Schenkling S. (eds.) Pars 52. Cerambycidae: Prioninae. W.Junk, Berlin: 108 pp.
- Lepesme P. 1950. *Longicornia. Études et notes sur les longicornes, publiées sous la direction de P.Lepesme*. Volume 1. Paris-Vie: 603 pp.
- Nylander U., 1998. Description of two new species of the genus *Osphryon* Pascoe, 1869 from New Guinea (Coleoptera, Cerambycidae, Prioninae). — *Entomofauna* **19**, No. 17: 277-284.
- Nylander U. 2004. Description of a new species of the genus *Rosenbergia* from Papua New Guinea. (Coleoptera, Cerambycidae). — *Lambillionea* **104**, No. 3: 401-404.
- Nylander U., Komiya Z. 2005. A new species of the genus *Analophus* Waterhouse. Short presentation and key for the known species of this genus (Coleoptera, Cerambycidae, Prioninae). — *Lambillionea* **105**, No. 3: 481-485.
- Rigout J. 1982. Description de nouveaux *Rosenbergia* (Col. Cerambycidae, Batocerini). — *Miscellanea Entomologica* **49**: 53-55.
- Rigout J. 1981. *Les Coléoptères du Monde*. Volume 1, Batocerini. Sciences Nat 2, Compiègne: 121 pp.
- Rigout J. 1982. *Les Coléoptères du Monde*. Volume 2, Batocerini 2. Sciences Nat 2, Compiègne: 128 pp.
- Rigout J. 2004. *Les Coléoptères du Monde*. Volume 2, Supplémentum 1, *Rosenbergia*. *Rosenbergia* nouveaux ou peu connus. Hillside Books, Canterbury: 11 pp.
- Santos-Silva A., Heffern D., Matsuda K. 2010. Revision of Hawaiian, Australian, Oriental, and Japanese Parandinae (Coleoptera, Cerambycidae). — *Insecta Mundi* **0130**: 1-120.
- Wallin H., Nylander U. 2006. A taxonomic revision in the genus *Rosenbergia*. — *Lambillionea* **106**, No. 3: 1-24.
- Wallin H., Nylander U. 2007. A taxonomic revision in the genus *Rosenbergia*, Part 2. — *Lambillionea* **107**, No. 1: 1-32.
- Weigel A. 2003. Zur Taxonomie, Synonymie und

Faunistik der Gattung *Tmesisternus* Latreille, 1829 mit Beschreibung zwei neuer Arten (Coleoptera: Cerambycidae, Tmesisternini). — *Veröffentlichungen des Naturkundemuseums Erfurt* **22**: 127-136.

Coleoptera: Curculionidae

- Gressitt J.L. 1977. Papuan weevil genus *Gymnopholus*: third supplement with studies on epizooic symbiosis. — *Pacific Insects* **17**, No. 2/3: 179-195.
- Porion T. 1993. *Les Coléoptères du Monde*. Volume 19, *Eupholus*. Sciences Nat 2: 112 pp.
- Setliff G.P. 2007. Annotated checklist of weevils from Papuan region (Coleoptera, Curculionoidea) — *Zootaxa* **1536**: 1-296.
- Stibick J.N.L. 1978. The genus *Pantorhytes* (Coleoptera: Curculionidae). — *Pacific Insects* **18**, No. 3/4: 115-136.
- Szent-Ivany J.J.H. 1970. Ethological and ecological observations on *Gymnopholus* spp. mainly *G. (s.) lichenifer* Gress. — *Pacific Insects* **12**, No 4: 763-768.

Coleoptera: Lucanidae

- Mizunuma T., Nagai S. 1994. *The Lucanid Beetles of the World*. Mushi-Sha's Iconographic Series of Insects 1: 338 pp.

Coleoptera: Scarabaeidae Dynastinae

- Endrödi S. 1985. The Dynastinae of the World. Series Entomologica **28**. Dr. W.Junk Publishers, The Hague: 800 pp + 46 pls.
- Dechambre R.-P., Lachaume G. 2001. Le genre *Oryctes*. *The Beetles of the World*. Volume 27. Hillside Books, Canterbury: 72 pp.

Coleoptera: Scarabaeidae Cetoniinae Schizorhinini

- Allard V. 1995. *Les Coléoptères du Monde*. Volume 24, Schizorhinini 2. Sciences Nat 2: 136 pp.

Handbooks and travel books

- Gressitt J.L., Hornabrook R.W. 1977. *Handbook of common New Guinea Beetles*. Wau Ecology Institute Handbook No. 2: 87 pp.
- Lightbody M., Wheeler T. 1985. *Papua New Guinea, a travel survival kit*. Lonely Planet Publications: 254 pp.
- Nolan R.W. 1983. *Bushwalking in Papua New Guinea*. Lonely Planet Publications: 136 pp.

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Plate 1

NYLANDER U. & HUDSON M.: Biodiversity in primary rainforest in Aseki and adjacent highlands ...



Figure 1. The rainforest from the road, Aseki (photo: M.Hudson).



Figure 2. View from Ekuti Divide, Aseki (2200 m) onto Hokanaiwa village on the ridge (photo: B.Howton).



Figure 3. Hokanaiwa village on the ridge at Ekuti Divide, Aseki (2200 m) (photo: B.Howton).



Figure 4. Mid-montane rainforest along the road, Aseki (photo: M.Hudson).



Figure 5. Second author had problems on the road in Aseki after flood (photo: M.Hudson).



Figure 6. One of too many timber trucks from the New Guinean rainforests (photo: M.Hudson).

Plate 2

NYLANDER U. & HUDSON M.: Biodiversity in primary rainforest in Aseki and adjacent highlands ...



Figure 1. A boy with *Calodema ribbei* Neervoort van de Poll, 1885 in Hokanaiwa (photo: V.Kostaseao).



Figure 2. Villagers in Hokanaiwa, Aseki (photo: M.Hudson).



Figure 3. Second author near Paiwini in Aseki, locality for *Rosenbergia xenium* Gilmour, 1959.

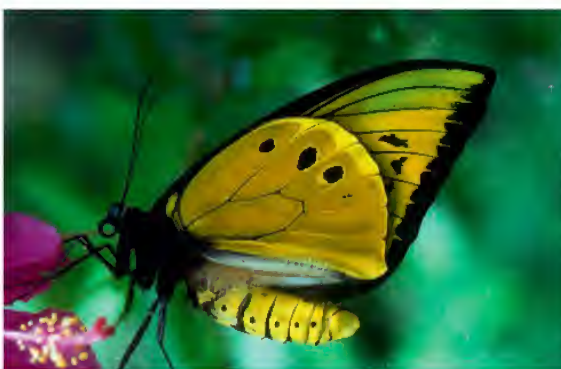


Figure 4. Male of *Ornithoptera chimaera* Rothschild, 1904 in the highland forest, Aseki (photo: M.Hudson).



Figure 5. Old Papuan mummies in the forest belonging to the village Angabena, Aseki (photo: B.Howton).



Figure 6. The Magnificent Bird-of-paradise, *Cicinnurus magnificus* (Pennant, 1781), shot by locals (photo: M.Hudson).

Plate 3

NYLANDER U. & HUDSON M.: Biodiversity in primary rainforest in Aseki and adjacent highlands ...



Figure 1. *Castiarina sedlaceki* Barker, 1988 from Mt. Kaindi (2300 m), the second known specimen (photo: U.Nylander).



Figure 2. Hitherto undescribed *Metataenia* species from Pawamanga village, Watut (photo: U.Nylander).

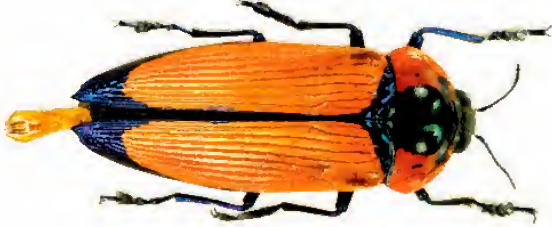


Figure 3. *Calodema longitarsis* Nylander, 2008 is only known by holotype specimen from Kerowagi (photo: U.Nylander).



Figure 4. *Calodema mariettae* Nylander, 1993, holotype specimen from Aseki (photo: U.Nylander).

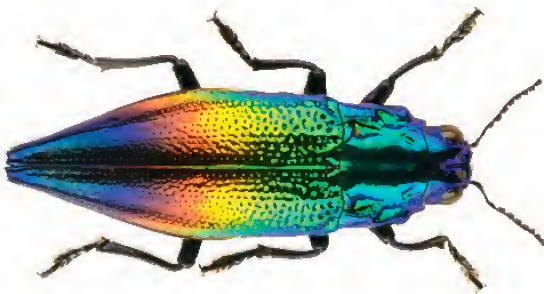


Figure 5. *Cyphogastara haidanae* Théry, 1923 from Gomemoa village, Garaina district, Morobe (photo: U.Nylander).

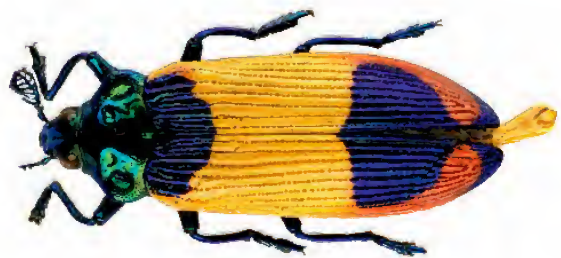


Figure 6. *Castiarina shelleybarkeri* Nylander, 2006 is only known by holotype specimen (photo: U.Nylander).

Plate 4

NYLANDER U. & HUDSON M.: Biodiversity in primary rainforest in Aseki and adjacent highlands ...



Figure 1. *Castiarina meeki* Théry, 1937 feeding on nectar (photo: B.Howton).



Figure 2. *Calodema hudsoni* Neef de Sainval, 1998 visiting flowering bush (photo: M.Hudson).



Figure 3. *Metaxymorpha apicerubra* Théry 1923 on a flowering bush (photo: M.Hudson).



Figure 4. *Calodema mariettae* Nylander, 1993 feeding on nectar (photo: B.Howton).



Figure 5. *Cyclommatus pulchellus* Möllenkamp, 1900 from Wau, Morobe (photo: U.Nylander).



Figure 6. *Prosopocoilus bison cinctus* Mountrouzier, 1857 from Wau, Kapiro village, Morobe (photo: U.Nylander).

Plate 5

NYLANDER U. & HUDSON M.: Biodiversity in primary rainforest in Aseki and adjacent highlands ...



Figure 1. Young hunter from Angabena village, Aseki (photo: B.Howton).



Figure 2. Papuan boys in a village, Aseki (photo: M.Hudson).



Figure 3. *Euodia elleryana*'s red flowers attract many various insects, especially Buprestidae (photo: M.Hudson).



Figure 4. Lower montane rainforest along the road from Aseki to Hokanaiwa (photo: M.Hudson).



Figure 5. *Gymnopholus* sp. from Aseki (photo: U.Nylander).



Figure 6. *Pantorhytes* sp. from Aseki (photo: U.Nylander).